



BSE NEWS

Virginia Tech Department
of Biological Systems Engineering

FROM SEITZ HALL

Greetings again from BSE at Virginia Tech!

I'm happy to report the successful conclusion of the Fall 2021 semester in a primarily in-person classroom environment. While we remain in a transitional status with safety measures in place, the campus-wide response to strong Virginia Tech mitigation policies has enabled us to enjoy a level of "normalcy" that we haven't experienced since Spring of 2020. Many uncertainties remain and there is much work in front of us as we navigate our way through living, learning and working in the coming months, but thanks to the "can-do" spirit that has fueled BSE's success for over a century now, our students, staff and faculty continue to excel in each aspect of the department's mission.

This issue of our newsletter provides an introduction to some of our recent graduates and current students. Though it's a small sample, I think you'll agree with me that BSE (still!) has an amazingly talented group of graduate and undergraduate students, and you'll be seeing many of these names in the coming years. We're also proud to report that one of our senior design teams ([Team Waves](#)) took first place in ASABE's Gunlogson Environmental Design Student Competition - reportedly the first time in departmental history that a BSE design team has won an ASABE-sponsored event of this nature! We're also proud to feature some of our BSE alums who are not only leveraging successful careers into enduring positive impacts, but who actively support and engage with BSE in a variety of helpful ways. You're also going to read about how some of our faculty - supported by BSE's dedicated, highly-performing staff - continue to excel in each of the three components of our land-grant mission: teaching, research, and extension. We now have over 140 undergraduate students (sophomore through senior), 41 graduate students (the most in five years, with 29 PhD students), four technical and four administrative staff, 21 tenure-track and six non-tenure track faculty, and \$1.25M in external research expenditures for Fiscal Year 2021. We are in excellent shape and on a positive trajectory, and it's because of the type of people you'll read about in this newsletter.

After a 20-year career at Virginia Tech during which he served as Professor, Extension Program Leader and Interim Department Head, [Dr. Bobby Grisso](#) retired on June 30th, 2021. Dr. Grisso is an internationally regarded leader in his profession whose work as extension specialist, researcher and teacher has positively impacted multiple states, multiple institutions, and countless individuals. His presence will be missed, but at the same time, each of us is happy to have worked alongside such an exemplary colleague. We are delighted to welcome [Dr. Anna Duraj-Thatte](#) and [Dr. Wujin Sun](#) to the BSE faculty. Drs. Duraj-Thatte and Sun joined BSE as Assistant Professors in late Summer, and each will be teaching and conducting research in the Biotech/Bioprocessing specialty area. Both are energetic, highly accomplished professionals with excellent experiences, and we are glad to have them as part of BSE. We have a new tenure-track faculty search underway for an Assistant Professor (research and extension) in the Translational Biotechnology area and we're hopeful of having that individual onboard by Fall 2022.

I hope you enjoy this newsletter. Please consider reaching out to me if you find yourself in the Blacksburg area, because I'm always delighted to visit with an alum or friend of BSE. Each of us in BSE wishes you and yours a safe and happy holiday season, and ...

GO HOKIES!

Sincerely,
Dwayne R. Edwards, Ph.D., P.E.
Professor and Head
dredwards@vt.edu

Department of Biological Systems Engineering
155 Ag Quad Lane
200 Seitz Hall
Blacksburg, Virginia 24061



COLLEGE OF ENGINEERING
COLLEGE OF AGRICULTURE AND LIFE SCIENCES
BIOLOGICAL SYSTEMS
ENGINEERING
VIRGINIA TECH.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

IN THIS ISSUE

STUDENT NEWS.....2-13

ALUMNI NEWS.....14-16

EXTENSION NEWS.....17-18

FACULTY + STAFF NEWS.....19-22

STAY CONNECTED

To follow the latest achievements of our students, faculty, staff, and alumni and view recent departmental news, visit our website.

WWW.BSE.VT.EDU

Follow us on social media for daily content, including announcements, event information, student features, departmental plans, and more!



VTBSE



VT_BSE



BSE_VT



Biological Systems
Engineering at
Virginia Tech

BSE STUDENT NEWS

2021 BSE Hokie Grad Profiles



BEING OF SERVICE: BSE SENIOR KIRIN ANAND MAKES AN IMPACT ON OLDER ADULTS WITH NRV COVID COMPANIONS

Being of service to a community and giving back are not unfamiliar concepts to Kirin Anand, an undergraduate student in the Department of Biological Systems Engineering. Serving others is a value that has been ingrained in Anand by his family. Anand's father arrived in the United States with only twenty dollars and he had to work his way up from nothing to support his family's new life. Growing up, Anand watched his father, mother, and grandmother help others within their community without hesitation, whether it was by giving financially or by offering their time.

Anand was also instilled with a love of science and math. Both of his parents were computer scientists, and he enjoyed the engineering and problem-solving aspects, but he yearned for a role in STEM that allowed him to communicate with people and help them directly. Anand found himself spending a lot of his time with physicians, as he lived close to his grandparents who had a variety of ailments that needed treatment. Being able to witness the work that these physicians were doing to make his grandparents' lives easier and better inspired Anand to become a primary care physician himself.

After going on a Virginia Tech campus tour, Anand knew this was the right school for him to fulfill his dream. When deciding on a major, he chose biological systems engineering because it allowed him to seamlessly bridge both the engineering field and medical field in ways that Anand did not think were possible. He would focus on the healthcare track in the department and join the pre-health professional fraternity, Delta Epsilon Mu. Anand also served as a BSE Ambassador for two years. "The BSE department has helped me so much throughout my undergraduate career so it was a no-brainer for me to become a BSE Ambassador and give back," he said.

Anand was a self-proclaimed introvert until the COVID-19 pandemic came to the United States. He once lived in an apartment full of people but found himself living alone for the first time in his life. "My friends had all moved back home and I stayed in Blacksburg. I thought I could be fine by myself but the pandemic taught me that I loved communicating with others and enjoyed being social," Anand said.

During his search for safe, socially-distanced interaction, he received a text message about a volunteer opportunity with the NRV COVID Companions, a program designed to improve the mental health and well-being of the NRV elderly population. The program pairs undergraduate students with elderly individuals in the area and tasks these students to call their assigned individual once or twice a week for an hour.

"I thought that if this pandemic was hard on me for my social interaction, I could only imagine that it must've been harder for a lot of the elderly who may not have had the ability to go on FaceTime or hang out with friends," Anand said. "I've always had a soft spot for the elderly, having lived with my grandma, so I thought this was the right opportunity for me."

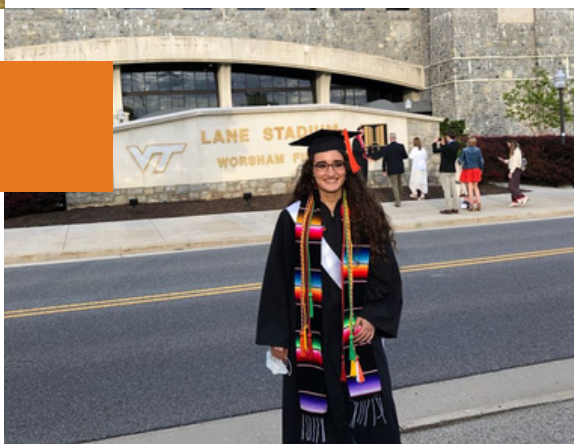


MATTHEW KIM

Matthew from Leesburg, Virginia focused on our Biotechnology pathway and minored in Biomedical Engineering and Chemistry. Matthew is now a Research Associate at Tessera Therapeutics in Boston, Massachusetts!

MARIA GABRIELLA DUARTE SPLINTER

Maria from Brazil focused on our Biotechnology track and minored in Biomedical Engineering. Maria will be pursuing a master's degree in Food Technology at Wageningen University in the Netherlands!



MICHAEL KINGSLEY

Michael from Lake Forest, Illinois focused on the Biotechnology track in our department and graduated this past spring. Michael is now a Process Specialist for AbbVie in Chicago, Illinois.



CORAL HENDRIX

Coral from Virginia Beach, Virginia pursued our Watershed and Environmental Health tracks. Coral is in our Accelerated Master's program under Dr. Tess Thompson studying the stream restoration completed on Stroubles Creek and will return to our department to complete her master's!



2021 BSE Hokie Grad Profiles



LINDSEY RICHARDSON

Lindsey from Dinwiddie, Virginia focused on our Biotechnology path and minored in Biomedical Engineering. After graduation in December 2021, Lindsey plans to move to the DC area to work for G2 Ops, Inc. as an Associate Engineer, where she'll take part in a rotational program in the fields of Model Based Systems Engineering, Cybersecurity, and Software Engineering.

2021 BSE Hokie Grad Profiles



NADINE MANNA

Nadine from Vienna, Virginia focused on our Biotechnology path in our department and minored in Biomedical Engineering. Nadine is now working for Zimpatica as an Associate Technical Consultant in their Fairfax, Virginia office.



WENNI CAI

Wenni from Chengdu, Sichuan, China focused on our Watershed pathway and minored in Green Engineering. Wenni will work as a Water Resource Engineer for Wood PLC in their Birmingham, Alabama location.



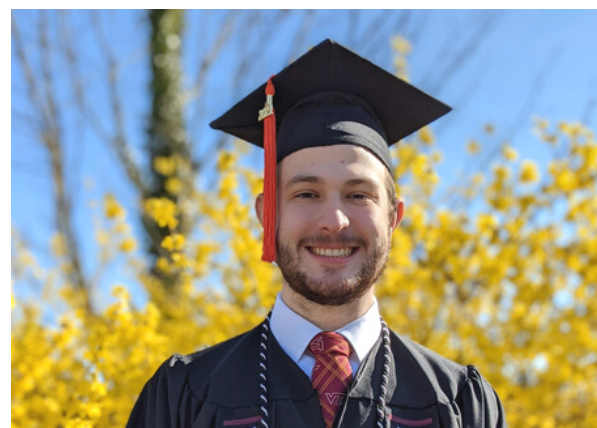
KATIE HEGADORN

Katie from Branchburg, New Jersey focused on our Biotechnology pathway and minored in Biomedical Engineering. She's now an Associate Scientist at AstraZeneca in their Gaithersburg, Maryland office.



MORGAN WIDDIFIELD

Morgan from Purcellville, Virginia focused on our Biotechnology track in the department and received a second degree in Psychology. Morgan is now a clinical specialist for Brainlab at MedStar Washington Hospital Center in DC.



ROBERT QUATTRONE

Robert focused on our Watershed Science & Engineering pathway and minored in Green Engineering. Robert now works as a remote engineer intern for Ecosystem Planning & Restoration out of their San Antonio, Texas office.



SARAH MOOREHEAD

Sarah from Long Valley, New Jersey focused on our Watershed and Environmental Health pathway, minored in Green Engineering and Watershed Management, and earned a dual degree in Philosophy. Sarah will be continuing her education at Virginia Tech and pursuing a master's degree in Civil and Environmental Engineering with a focus in Environmental and Water Resources.

2021 BSE Hokie Grad Profiles



SOFIE SAUNER

Sofie was admitted into the Virginia Tech - Wake Forest University School of Biomedical Engineering and Sciences (SBES). She'll be working towards a master's degree in Biomedical Engineering and working alongside VT BEAM professor, Dr. Rafael Davalos.

CAMERON CORNWELL

Cameron from Holly Springs, North Carolina pursued a master's in BSE dealing with using watershed boundaries as a way of identifying exposure in Central Appalachia. Cameron worked with Dr. Leigh-Anne Krometis this past summer and will be receiving his GIS certification soon!

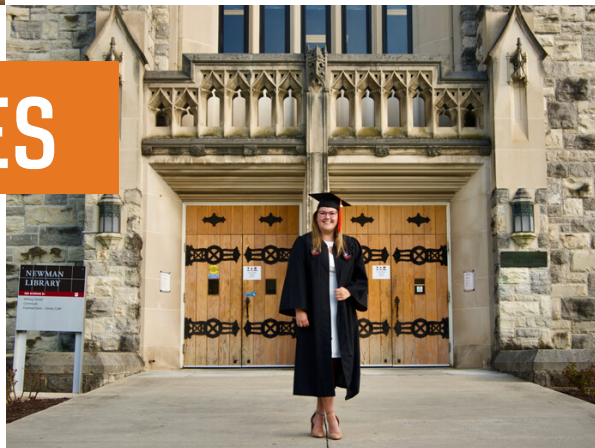


MAGGIE BOYER

Maggie from Dallas, Texas focused on our Biotechnology track and minored in Biomedical Engineering. Maggie is now a Research Technician at Locus Biosciences, Inc. in Morrisville, North Carolina.

JESSICA JONES

Jessica from Spotsylvania, Virginia focused on our Environmental Health track and minored in Green Engineering and Environmental Science. Jessica now works for Legacy Engineering in Fredericksburg, Virginia.



2021 BSE Hokie Grad Profiles



From left to right: Emily Schiesl, Carly Jaxtheimer, Brian Nguyen, Morgan Widdifield, and Jessica Jones, five of the six members of Team Waves, photographed at Virginia Tech's outdoor graduation ceremony this past spring.



Team Waves member, Layla Almuallem (right), photographed alongside close friend and Chemical Engineering student, Shaden Albahran (left), at Virginia Tech's outdoor graduation ceremony this past spring.

One of our Senior Design Teams won the ASABE Gunlogson Environmental Design Student Competition! The purpose of the competition is to encourage undergraduate students to participate in the design of a relevant engineering project and to provide an arena of professional competition for environmentally- and biologically-related design projects. This competition is complementary to the AGCO National Design Competition, which focuses on agricultural- and food-related projects, while Gunlogson focuses on environmentally- and biologically-related projects. Team Waves was awarded first place for their presentation on Breaking Waves at Claytor Lake. Team members Layla Almuallem, Carly Jaxtheimer, Jessica Jones, Brian Nguyen, Emily Schiesl, and Morgan Widdifield developed a solution designed to reduce the erosion of the Claytor Lake shoreline of a cattle and horse farm in Pulaski County while also enhancing the endangered mussels' habits in that area. Their presentation and responses to questions from the audience were excellent! It's wonderful to see their hard work and preparation recognized. Acknowledgements are in order for the support provided by Dr. Jonathan Czuba, Dr. Emily Bock, Kelly Ramsey, and Sharyl Ogle (advisors) as well as Comprehensive Design instructors Drs. Robert "Bobby" Grisso and Cully Hession, supported by the talented Billy Paraszczuk. Congratulations, Team Waves!

SAVE THE DATE: Virginia Tech ASABE Southeastern Region Student Rally



The Virginia Tech Student Chapter of ASABE was hard at work in November raking yards in Blacksburg to raise money for the Virginia Tech ASABE Southeastern Region Student Rally that our department plans to host on the first weekend in April 2022 (Friday, April 1-Sunday, April 3).

Rally will be in-person for the first time in 3 years and the final program will include a blend of networking events, interactions with industry leaders, professional development, and sharing experiences with one another. Our goal is to create an experience that students find both worthwhile and fun.

For questions or concerns regarding Rally, please contact Jonathan Czuba at jczuba@vt.edu.

Visit www.bse.vt.edu/virginia-tech-asabe-rally-2022 for more information.

Summer Internships and Co-op Opportunities



RACHEL LAKE

Rachel Lake, senior, interned at the Celanese Plant in Narrows, Virginia, where she worked in the EHS department with a focus on environmental projects. She worked with the wastewater treatment plant and landfill as well as started a recycling program at the plant. Fun fact: She was their FIRST Biological Systems Engineering Intern!



SAM JANOUSEK

Sam Janousek (far left), senior, interned at Mango Materials in San Francisco, California! Sam was tasked with sampling every 2 hours and performing subsequent photo spectrometry testing for OD and nutrients. He designed a canopy for the site to provide shade and shelter from the elements.



JULIA BRUNEAU

Julia Bruneau, junior, completed a remote summer internship with Ramboll. Julia was tasked with searching for information on Ramboll's core customers in order to help market and sell their projects and negotiate with customers. She's learned a lot about how sustainability is taken into account in marketing and how big of a role sustainability has nowadays in staying competitive as a company.



SARAH LOOMIS

Sarah Loomis, senior, interned for CDM Smith's Water Services Group in Nashville, Tennessee! Sarah mostly worked on sewershed modeling in ArcGIS and added over 1,100 pipes to their model of Nashville's sewer system. She also made diagrams showing what pipes needed rehabilitation or separation between stormwater and wastewater.



DIANA SCHMIDT

Diana Schmidt, senior, worked as a Pathways Engineering Intern with the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) in Fort Collins, Colorado this past summer! Diana assisted in the planning, design, and review of a variety of projects to help landowners manage their land efficiently while remaining environmentally conscious. She was involved with the statewide Emergency Watershed Protection Plan (EWP) to aid in recovery and water protection following the 2020 forest fires.

Summer Undergraduate Research Fellowship Programs



SAMANTHA SAN

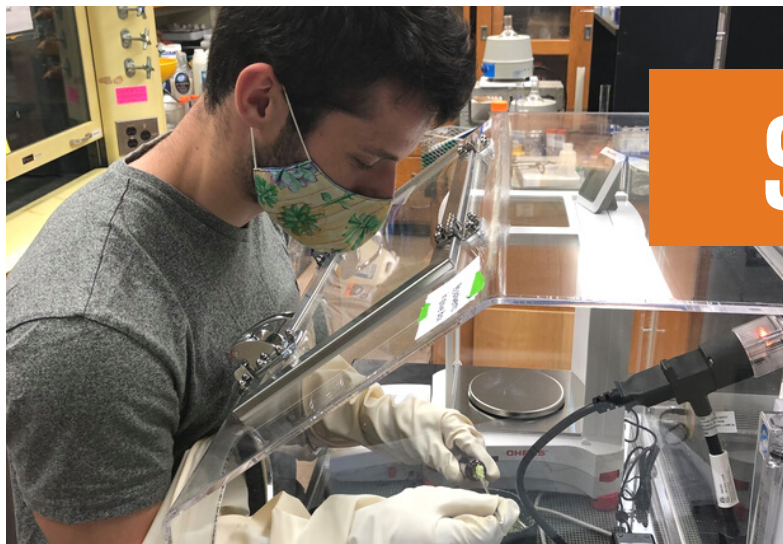
Samantha San, junior, was the first BSE undergraduate student to participate in the Fralin Summer Undergraduate Research Fellowship (SURF) program.

"I'm grateful for the opportunity to have been a SURF fellow because I was able to dedicate more time towards research and professional development," San said. "It was especially exciting that the program was in-person." San's faculty mentor was Dr. Juhong Chen.

STEVEN KENAH

Steven Kenah, sophomore, was a part of the Translational Plant Sciences Center Summer Undergraduate Research Fellowship!

"It has been a thrill to be a part of the TSPC-SURF," said Kenah. "I have gained valuable skills such as learning about PCR, creating Agarose gels, and conducting zymolyase digestion. It's been really cool to see what I have learned in the lab and classes being applied to plant sciences."



SAM GARBERA

Sam Garbera, senior, completed summer research with the Virginia Tech Food Science and Technology Department! He prepared samples of edamame beans whose flavor and volatile molecules were measured and compared across growing regions and varieties.

The objective? Find the most favorable bean for consumers and growers.



VIRGINIA TECH SOIL JUDGING TEAM TAKES HOME SIXTH NATIONAL CHAMPIONSHIP

The Soil Judging Team finished first out of 21 teams at the inaugural Virtual National Soil Judging Championship held in April.

“This virtual contest was a huge success because it allowed us to have some continuity in teaching students and keeping the soil judging clubs and teams active during the pandemic,” said John Galbraith, one of two team coaches and a professor in the College of Agriculture and Life Sciences’ School of Plant and Environmental Sciences. “The contest was created because the organizers did not allow the pandemic to deny a whole set of students a learning opportunity provided by soil judging.”

The team was led by third-place finisher Bernie Frantz, a sophomore from Shavertown, Pennsylvania, majoring in biological systems engineering. Also competing were Alex Greehan, a junior from McLean, Virginia, majoring in mechanical engineering; Clare Tallamy, a sophomore from Leesburg, Virginia, majoring in environmental science; Kathlynn Lewis, a graduating senior from Charlottesville, Virginia, majoring in environmental science; Michael Russell, a graduating senior from Richmond, Virginia, majoring in environmental science; Lisa Small, a freshman from Williamsburg, Virginia, majoring in engineering; and Tessa Naughton-Rockwell, a junior from Alexandria, Virginia, majoring in crop and soil sciences. All students finished in the top 30 percent of participants.

The Hokies finished in first place, followed by University of Wisconsin-Stevens Point, Utah State University, Cal Poly San Luis Obispo, and the University of Minnesota. Awards were sponsored by the Soil Science Society of America.

“This contest was challenging because the students had to learn about a wide variety of soils that formed in very different conditions - from the tropics and the desert to the arctic. The practices covered almost all soil types on Earth, and so was a very comprehensive study in soil genesis, chemistry, morphology, and classification. The study supplements what they learned in other classes,” said Jaclyn Fiola, a horticulture Ph.D. candidate and second coach of the team.

The Hokies practiced twice per week in the field and the soils lab whenever possible, wearing masks and staying socially distant.

“Their hard work, great cooperation, and teamwork earned them the national title,” said Galbraith. “They earned it and deserve the title of champions.”

The virtual contest will likely be offered even after the in-person contests begin again this fall, as it offers a unique learning opportunity open to all students at all colleges and universities, not just the ones with established soil judging teams.

Full story is available to read on our website in our BSE Newsroom.

In the Classroom



Our Introduction to Biological Systems Engineering (BSE 2004) class (taught by Drs. Jonathan Czuba and Clay Wright) took measurements at Duck Pond this semester to estimate water discharge and suspended solids concentration to perform a mass balance analysis of water and suspended material into and out of the pond.



Dr. Cully Hession teaches Field Methods in Hydrology and his class has taken the learning experience outside several times this semester!



BSE students participated in a rainfall simulator lab in September in BSE 2004: Intro to Biological Systems Engineering, which is co-taught by Drs. Jonathan Czuba and Clay Wright!



BSE Ice Cream Social



On Monday, October 4th, 2021, the Department of Biological Systems Engineering hosted our Fall Ice Cream Social after having to cancel our 2020 Ice Cream Social due to COVID-19. It was a great opportunity to socialize with one another after spending the last school year online and celebrate the return to in-person teaching and learning. Faculty, staff, undergraduate and graduate students, and a few BSE alumni attended the event. Homestead Creamery provided a variety of flavors and the BSE community got a chance to mingle and hear from representatives of our BSE student groups (VT ASABE, Alpha Epsilon, and the BSE Graduate Student Organization). We wrapped up the event with a raffle for students to win BSE swag items. Everyone had a blast and we look forward to hosting this event again next year!



Graduate Student News



Mina Shahed Behrouz, BSE PhD student (advisor: Dr. David Sample), was awarded a grant from the Virginia Water Resources Center for her proposal entitled "New conceptualizations of catchment-scale stormwater pollutant generation processes."



BSE PhD student Riley DeHority (advisor: Dr. Chenming "Mike" Zhang) wrote an article titled "Nonbinary Scientists Want Funding Agencies to Change How they Collect Gender Data" and it was featured in Scientific American.



To celebrate Katherine Wardinski's successful master's thesis defense in mid-August, BSE and biology graduate students and Dr. Durelle Scott (Wardinski's advisor) came together to celebrate.



BSE MS student Sierra Smith (advisor: Dr. Jonathan Czuba) measuring sediment on the streambed of the North Fork Roanoke River on September 30th, 2021. Sierra is measuring embeddedness -- the extent to which large sediment particles are surrounded by finer sediment -- and sediment particle size, which are important metrics describing aquatic habitat quality, to test new methods our group is developing to estimate these measures remotely and assess any potential fine sediment impacts on the streambed from the Mountain Valley Pipeline.

Graduate Student News



KATHERINE WARDINSKI



ELIZABETH PRIOR

SIX ENGINEERING GRADUATE STUDENTS NAMED NSF GRADUATE RESEARCH FELLOWS

Six graduate students from across five departments of the College of Engineering have been selected for the National Science Foundation Graduate Research Fellowship Program in 2021.

The fellowship program is the country's oldest in support of doctoral and master's students in science, technology, engineering, and mathematics fields, as stated by the organization, and its aim is to recognize and empower the next generation of knowledge experts who can contribute in meaningful ways to research, teaching, and innovations in science and engineering.

This year's recipients represent a broad set of interests ranging from the socio-economic implications of flood protection for underserved communities to human-robot interaction. Two of the fellows also represent the College of Agriculture and Life Sciences as members of the Department of Biological Systems Engineering.

"These fellows are honing their expertise in research, leadership, and innovation, while asking critical questions within each of their disciplines," said Pam VandeVord, engineering's associate dean for research and graduate studies. "This award represents an investment in each student's potential to impact the future of engineering, and it's exciting to see the vision and hard work they're putting into these fellowships."

Second-year master's student Katherine Wardinski will build upon her master's degree research exploring carbon cycling in geographically isolated wetland soils. She hopes her research will inform wetland restoration efforts and help advocate for the protection of vital water resources.

With her fellowship funding, second-year doctoral student Elizabeth Prior aims to better understand and model how vegetation affects flooding, specifically how vegetation resists flow. She will be mentored by Cully Hession of the biological systems engineering department and Valerie Thomas of the forest resources and environmental conservation department.

Full story is available to read on our website in our BSE Newsroom.

ALUMNI NEWS



ALUMNI SPOTLIGHT: HOW CARLA RAMPY BECAME THE PRESIDENT AND CEO OF LEADING BIOTECHNOLOGY FIRM, QUALITY AGENTS

Biological Systems Engineering alumna, Carla Rampy ('99), is the President and CEO of Quality Agents, a work force solutions company in Rockville, Maryland that provides validation engineers and quality assurance resources to assist pharmaceutical and biotechnology companies. Quality Agents was formed because Rampy believed that she didn't have to choose between being a mother and having a successful career.

"I feel like when women have children, there's this expectation that we have to compromise, and I don't think we have to," Rampy said. "You can have a great family life and work life, if you have the chance, and I love being able to provide this opportunity for other female engineers."

Full story is available to read on our website in our BSE Newsroom. Rampy was also featured in Virginia Tech Engineering's Fall 2021 Magazine.



BOLD CAREER CHOICE LEADS TO ALUMNUS EARNING TEACHER OF THE YEAR HONOR

After graduating from Virginia Tech in 1986 with a degree in agricultural engineering, Phil Arnold worked for six different companies, and at one time, was an independent consultant before finding his true calling. He traveled all over the world, going to places like Taiwan. He worked in software development, telecommunications, computer systems, and programming and management systems. He built a tremendous reputation and diverse career in doing so.

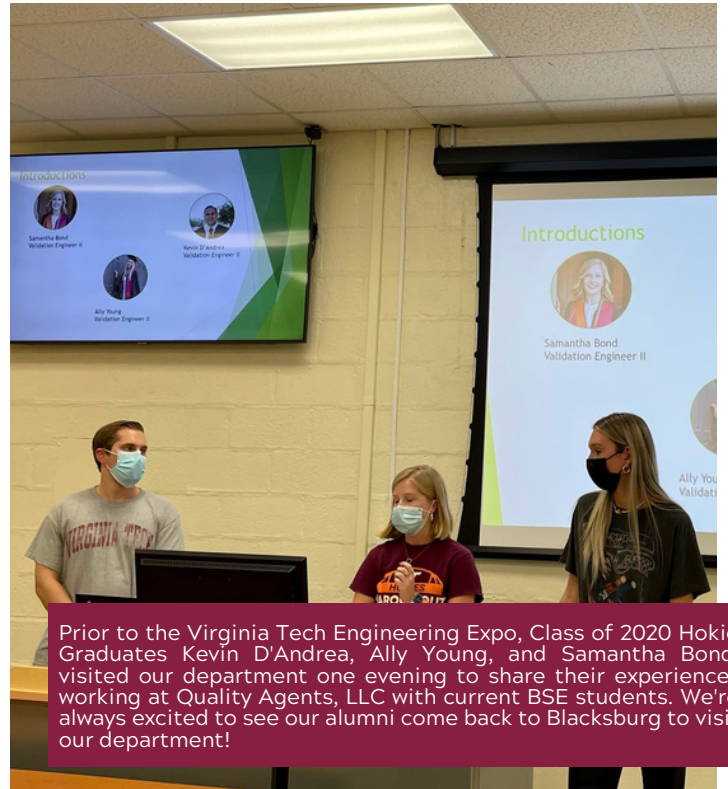
Yet in 2010, Arnold made a drastic turn and decided to pursue a starkly different career path. He became a high school teacher - and he absolutely has no regrets.

Arnold's success as a computer-aided design architecture and engineering teacher at The Career and Technology Center in Frederick, Maryland, during the past COVID-plagued school year earned him national attention in late April. The Washington Post tabbed Arnold as its 2020-21 Teacher of the Year.

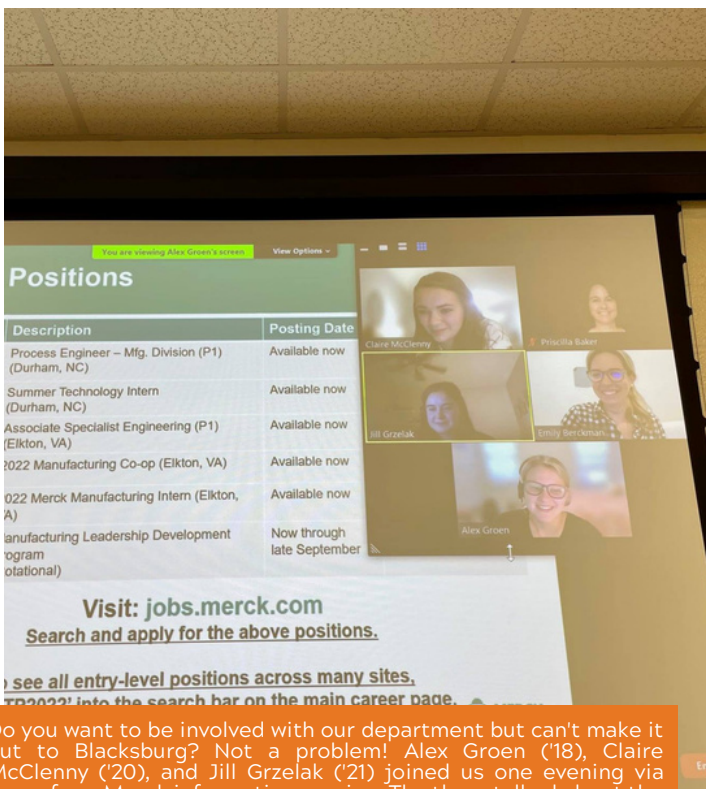
Full story is available to read on our website in our BSE Newsroom.



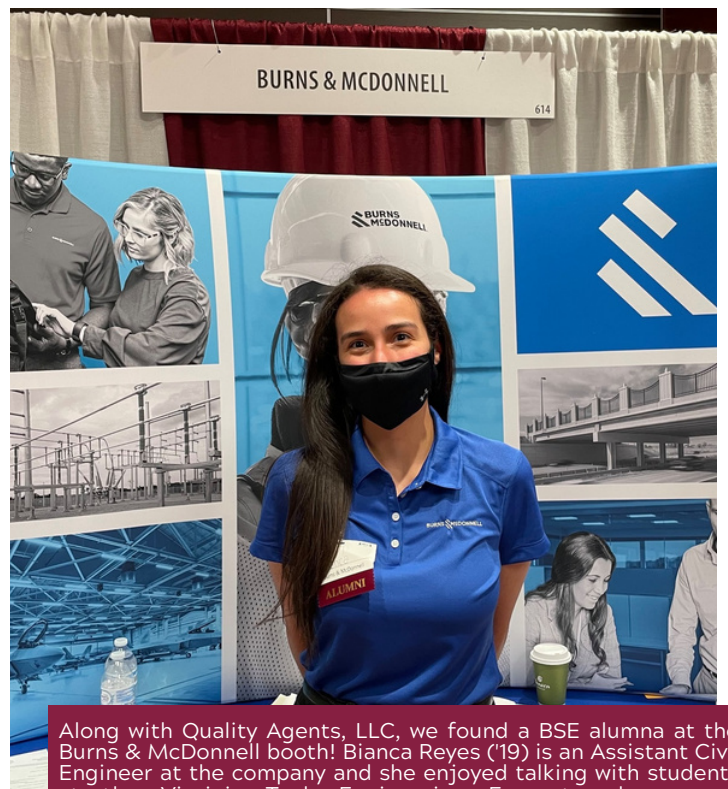
The Virginia Tech Engineering Expo returned to campus this semester at the Squires Student Center and we were thrilled to see our BSE alumni so eager to talk with our students and share available career opportunities with them. At the Quality Agents, LLC booth, we found Ally Young ('20), Carla Rampy ('99), Samantha Bond ('20), and Kevin D'Andrea ('20).



Prior to the Virginia Tech Engineering Expo, Class of 2020 Hokie Graduates Kevin D'Andrea, Ally Young, and Samantha Bond, visited our department one evening to share their experiences working at Quality Agents, LLC with current BSE students. We're always excited to see our alumni come back to Blacksburg to visit our department!



Do you want to be involved with our department but can't make it out to Blacksburg? Not a problem! Alex Groen ('18), Claire McClenny ('20), and Jill Grzelak ('21) joined us one evening via Zoom for a Merck information session. The three talked about the various open positions at Merck as well as their own experiences working for the company. We know that our students appreciated this information session. Thank you Alex, Claire, and Jill for taking the time to speak with our students. We also want to thank Emily Berckman (Biochem '14 Hokie Grad) and our undergraduate advisor, Priscilla Baker, for making this event possible!



Along with Quality Agents, LLC, we found a BSE alumna at the Burns & McDonnell booth! Bianca Reyes ('19) is an Assistant Civil Engineer at the company and she enjoyed talking with students at the Virginia Tech Engineering Expo to share open opportunities and positions at Burns & McDonnell. She's eager to see some BSE students potentially join her and her team! The Virginia Tech Engineering Expo happens every fall semester in September and we'd love to see more BSE Alumni! Consider registering your business or company for the second largest student-run career fair in the country.



Jessica Slagle ('19) works at Timmons Group in their Richmond stormwater group and was recently interviewed by Lillian Minix, where they talked about stormwater management and the various projects Jessica's worked on. You can read the full blog article about Jessica titled "Emerging Solutions: Redesigning Streams for a Sustainable Future" on the Timmons Group blog.



Jenna Sharkey ('15) is graduating from Indiana University with a Master's in Global Health & Sustainable Development. Jenna works for ERM in Salt Lake City as a sustainability consultant and aspires to become a Corporate Sustainability Manager! And yes, our undergraduate advisor, Priscilla Baker, did pay Jenna a visit! Spotted in Park City, Utah.

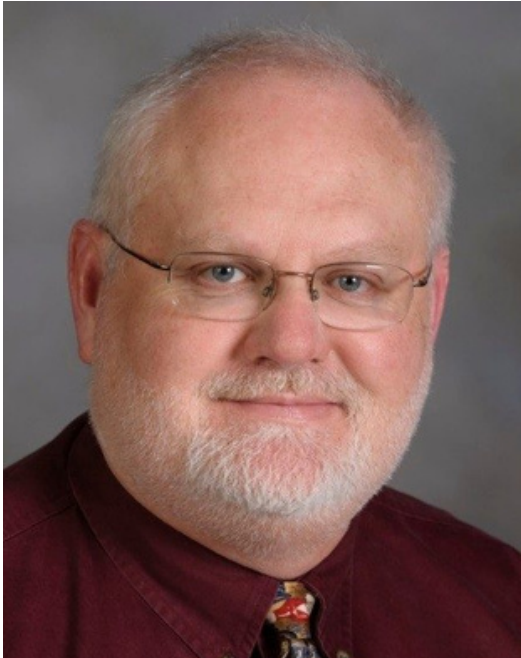


Heather Bomberger ('16) recently defended her PhD thesis at University of Minnesota Twin Cities and will be starting a job at Boston Scientific in Minneapolis as an R&D Engineer in interventional oncology in 2022.

Photographed with their rabbit, Carol Yang ('20) from Charlottesville, Virginia focused on our Environmental/Watershed Engineering track and minored in Green Engineering and Computer Science. They now work as a Stormwater Technician with the City of Charlottesville Public Works Department to support the City's Water Resources Protection Program.



EXTENSION NEWS



Clean water is essential for life. Dr. Brian Benham, professor and extension specialist in the Department of Biological System Engineering, works with state agencies and stakeholders to develop local watershed management plans that, when implemented, reduce the level of pollution in lakes, streams, and rivers. Benham also educates homeowners reliant on private water supplies like wells on how to better care for and maintain their water supply systems to improve the quality of their drinking water. His integrated research and extension program strives to develop and disseminate knowledge that promotes effective water resources management to improve water quality.

Benham and his team are currently working with the Virginia Department of Environmental Quality to develop total maximum daily loads (TMDLs) to address polychlorinated biphenyls (PCBs) impairments in several watersheds in Virginia, including impaired sections of the main stem of the James River and impaired segments on two tributaries, the Jackson and Maury Rivers. TMDLs are developed for waters that do not meet applicable water quality standards. The TMDL process involves developing computational models that are used to help further characterize pollutant sources and the study watershed, determine the level of pollutant reduction required for the impaired waterbody to meet applicable water quality standards, and educate stakeholders about the issue and potential ways to achieve the needed pollutant reductions.

The BSE TMDL development program includes both an applied research component that involves both graduate and undergraduate students, and an extension component that includes educating stakeholders, state and federal agency staff, and consulting engineers. The program has developed 165 TMDLs since 2001; 25 TMDL implementation plans since 2006; and conducted 19 TMDL educational workshops since 2000.

The BSE TMDL program began under the guidance of Drs. Saied Mostaghimi and Theo Dillaha. The program wouldn't have been possible without the professional staff that have worked in the program over the years including, but not limited to, Gene Yagow, Karen Kline, Rebecca Zeckoski, Kevin Brannan, C.J. Mitchem, Maria Ball, and Emily Smith-McKenna as well as the many graduate and undergraduate students who have contributed to the program.



John Ignosh, Advanced Extension Specialist in the Department of Biological Systems Engineering, works to improve the financial and environmental sustainability of agricultural production systems. To achieve this goal, Ignosh's extension programming focuses on the implementation of best management practices (BMPs) related to energy efficiency, renewable energy, and nutrient management technologies. Ignosh's extension programming is needs-based in order to target issues of inherent concern to clientele, to ensure program relevancy, and to maximize its impact. Needs-based programming focuses on assessing current and emerging issues of concern among clientele, then reviewing and adapting relevant research-based content into a format that is accessible and tailored to meet stakeholder needs. This approach leverages existing scholarly content and also helps to identify future research priorities.

This year, in collaboration with Dr. Robert "Bob" Lane (BSE), Matt Booher (Virginia Cooperative Extension), and Dr. Gabe Pent (Shenandoah Valley Agricultural Research and Extension Center), Ignosh's extension program explored a variety of on-farm distributed energy solar applications, including solar-powered water pumping. The team was able to evaluate these systems alongside host technology farmers to assess their long-term usability. This work was supported by the National Fish and Wildlife Foundation, in collaboration with the Chesapeake Bay Foundation, and the Virginia Department of Energy.

Additionally, Ignosh and Dr. Jactone Ogejo (BSE) worked together to evaluate air emissions from two on-farm bioenergy projects. These on-farm projects use biomass to heat poultry houses and displace propane. The project work occurred with technology host farmers in Pennsylvania, with the support of a Conservation Innovation Grant from Natural Resources Conservation Service and in collaboration with Sustainable Chesapeake. Collaborators plan to share project results at the Waste-to-Worth conference in 2022.

Additional project work was also funded by an integrated internal competitive grant from the College of Agriculture and Life Sciences at Virginia Tech to identify research and extension priorities related to large-scale solar projects in Virginia. The 13-member interdisciplinary team includes BSE collaborators Dr. David Sample, Dr. Julie Shortridge, Lane, and Ignosh. The project team is currently exploring issues related to stormwater management, site vegetation challenges, and potential opportunities for dual use across utility-scale solar in Virginia.



FACULTY + STAFF NEWS

The Department of Biological Systems Engineering and five of our Watershed and Science Engineering faculty were featured in Virginia Tech magazine! We take pride in developing strategies to protect existing water resources and finding solutions to related problems. The faculty featured in the piece were Drs. Cully Hession, Leigh-Anne Krometis, David Sample, Durelle Scott, and Venkat Sridhar.



A STREAM OF INFORMATION ABOUT HOW VIRGINIA TECH IS WORKING TO PROTECT AND PRESERVE AN ESSENTIAL RESOURCE

Virginia Tech alumni and students often refer to the university and the Blacksburg campus as a piece of heaven on earth. But long before achieving that status, the region's abundant resources and natural beauty were likely the allure that attracted early inhabitants and settlers.

The Tutelo/Monacan people are the historic custodians of this lush region, which experienced an influx of settlers from Europe beginning in the mid-1700s. Campbell speculates that former British sea captain James Patton was captivated by the landscape when he explored Blacksburg during that period. The relatively flat valley, surrounding mountains, and Stroubles Creek watershed likely contributed to Patton's decision to found Draper's Meadows, the outpost that eventually became Blacksburg.

Over the next 300 years, Stroubles Creek played a major role as Draper's Meadows grew, changed its name, and eventually became home to the university now known as Virginia Tech. And while the creek's influence on the history of the community and the university is clearly evident, the waterway continues to shape the present and affect plans for the future.

“
The town of Blacksburg is largely here because of Stroubles Creek.
Dr. Cully Hession
”

[...]

Sustainably managing water resources is a complex challenge, with issues that range from developing efficient water systems for individual households to understanding the far-reaching effects of global climate change on water availability regionally, nationally, and globally.

Finding long- and short-term solutions to address water access, use, conservation, pollution, and other problems requires knowledge from a broad spectrum of academic disciplines. The study of water has long been an integral part of the curricula for students in a variety of majors across Virginia Tech's campuses, from engineering and science to agriculture and forestry.

One example is a dual program between the College of Agriculture and Life Sciences and the College of Engineering, housed in the Department of Biological Systems Engineering (BSE), that includes water-focused study. BSE applies concepts from biology, chemistry, and physics, along with engineering science and design principles, to solve problems associated with environmental protection, conservation of natural resources, environmentally sound production of renewable resources, and conversion of these resources to value-added products, such as food, pharmaceuticals, polymers, and biofuels.

[...]

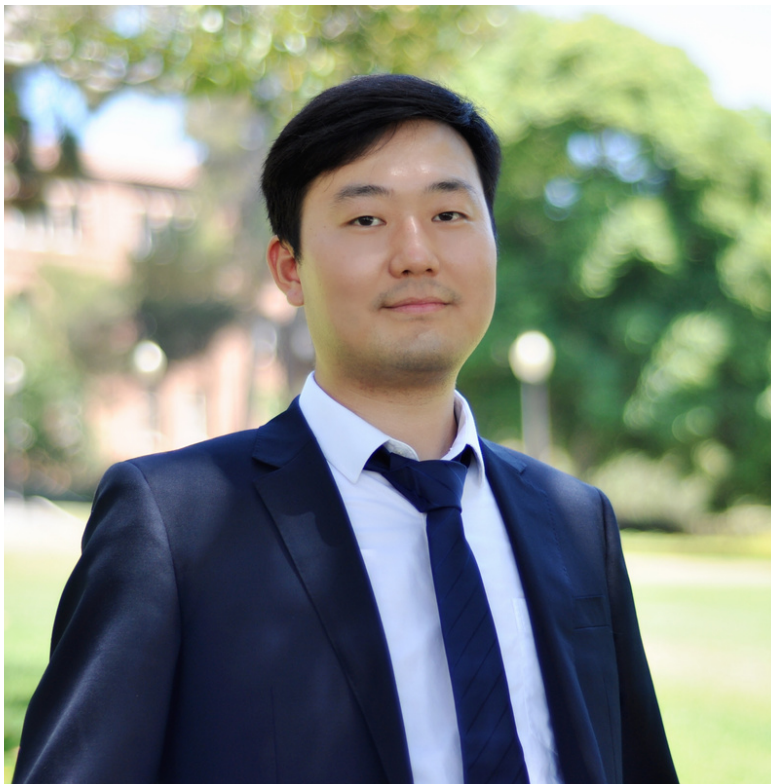
Water research isn't limited to agriculture conservation or coastline protections. Venkat Sridhar, associate professor of biological systems engineering, studies water resources all around the world. He develops complex mathematical models by layering and weaving together existing datasets, with information gleaned from NASA, the National Oceanic and Atmospheric Administration, and others, to predict future precipitation, temperature, snowmelt, streamflow, soil moisture, droughts, and floods.

[...]

David Sample, a professor in the Department of Biological Systems Engineering, leads a project to monitor urban runoff quality from Fredericksburg's local sub-watersheds and assess stormwater controls. Lee Daniels, a professor in the School of Plant and Environmental Sciences, tracks the formation of strongly acidic soils in the area and evaluates solutions to mitigate their effects.

“
Our very future depends on having clean, reliable water sources.
Dr. Venkat Sridhar
”

New & Retiring Faculty



Let's welcome Dr. Wujin Sun to the department! Sun joined BSE in late summer as an Assistant Professor and we look forward to his many meaningful contributions to BSE, the College of Agriculture and Life Sciences, and Virginia Tech. Sun graduated from the The University of North Carolina at Chapel Hill and NC State University's Joint Department of Biomedical Engineering and most recently worked with the Department of Bioengineering at UCLA.



Join us in welcoming Dr. Anna Duraj-Thatte to the Department of Biological Systems Engineering! Duraj-Thatte joined us in late summer as an Assistant Professor and we're delighted to have someone of Duraj-Thatte's qualifications and experience join us. She graduated from Georgia Tech and is a Research Affiliate in Living Materials at Massachusetts Institute of Technology (MIT). She previously worked as a researcher with the Wyss Institute for Biologically Inspired Engineering at Harvard University.



ROBERT "BOBBY" GRISSO RETIRES AFTER 20-YEAR CAREER AT VIRGINIA TECH

After a distinguished career as a faculty member, extension program leader, graduate program director, administrator, and advisor for the local chapter of the American Society of Agricultural and Biological Engineers (ASABE), Robert "Bobby" Grisso, professor and extension engineer, retired in June 2021. He stepped away after serving 20 years in the Department of Biological Systems Engineering, the College of Agriculture and Life Sciences, and the College of Engineering.

"I've enjoyed my career tremendously and I think this is a good time for me to walk away. I really appreciated the opportunity to come and work at Virginia Tech," said Grisso. "This is where I call home and I've seen it as a huge honor to serve in a variety of different roles and missions of the university."

Shortly after retiring, Grisso was conferred the title of professor emeritus by the Virginia Tech Board of Visitors in late September. The emeritus title may be conferred on retired professors, associate professors, and administrative officers who are specially recommended to the board by Virginia Tech President Tim Sands in recognition of exemplary service to the university. Nominated individuals who are approved by the board receive a copy of the resolution and a certificate of appreciation.

Read the full story on our website in our BSE Newsroom.



A VACCINE AGAINST OPIOID ADDICTION? RESEARCHERS AT VIRGINIA TECH ARE WORKING ON IT.

When an opioid drug enters your brain, it floods dopamine throughout the body, prompting feelings of pleasure and happiness.

As you take more, you build up a tolerance. It then takes more of the drug to capture those same feelings, and over time you can become addicted to achieving that high.

But what if doctors could stop that molecule from getting to your brain in the first place, preventing the high that so dangerously keeps people coming back for more?

Researchers at Virginia Tech are working on such a solution, in the form of a vaccine.

They hope that by training the body to form antibodies against opioids, a shot could not only help people already hooked on the drugs but also prevent others from becoming addicted, said Mike Zhang, a professor of biological systems engineering who's leading the project.

His team started the work not long before the coronavirus struck. But it's taken on new gravity in light of the pandemic's magnifying effects on the opioid epidemic.

Read the full [Virginian Pilot](#) article on our website in our [BSE Newsroom](#).

COMBATING ANTIBIOTIC RESISTANCE WITH DATA-DRIVEN SURVEILLANCE

Since the world's first broadly effective antibiotic arrived in 1928, bacteria have evolved new strategies to fight back against antibiotics. Current trends show that antibiotics are increasingly failing to prevent, treat, or cure bacterial infections. Some projections imply that by 2050, antibiotic resistance fatalities may outnumber those of cancer.

Virginia Tech researchers are using data-driven surveillance to learn more about the antibiotic resistant bacteria that are lurking in communities across Virginia and the world. The transdisciplinary team has been turning to the sewers to track a variety of existing and new pathogens, including SARS-CoV-2, with the goal of giving early warnings of outbreaks that are on the way to a community.

[...]

"The smaller the community or the more geospatially distinct the monitoring, the more likely the source of disease markers might be linked to specific clusters of homes, presenting challenges with respect to confidentiality," said Leigh-Anne Krometis, an associate professor and Turner Faculty Fellow in the Department of Biological Systems Engineering, an affiliate of the Global Change Center and of the Center for Emerging, Zoonotic, and Arthropod-borne Pathogens, and co-principal investigator on the project.

Read the full story on our website in our [BSE Newsroom](#).



Drs. Durelle Scott and Venkat Sridhar were featured in the 2021 edition of the Virginia Tech College of Agriculture and Life Sciences Magazine!

--

Scott is the lead author of a paper recently published in the academic journal *Nature Communications* that examines flooding in the continental United States in nearly unprecedented detail. Scott and his co-authors looked at what Scott calls “everyday” flooding in streams and rivers of all sizes.

“The big picture is that flooding across the world is increasing with climate change, but not all flooding is bad and catastrophic,” said Scott. “We wanted to do an analysis where we captured the variability in annual flooding that occurs within small streams to larger rivers.”

Read the full story on our website in our BSE Newsroom.

Sridhar is using big data to create computer models that can help improve the management of water in a changing global climate.

“Water is the crux of everything,” Venkat Sridhar says.

It’s the lifeblood for agricultural production of the fertile land that rims the Chesapeake Bay. It’s the engine of an economic boom along the Mekong River where hydro dams are a growing issue. And it’s the elusive resource in Sridhar’s hometown in India, where people are grappling with “Day Zero,” when millions ran out of drinking water.

Read the full story on our website in our BSE Newsroom.



Dr. Leigh-Anne Krometis's 2019 study titled "Water Scavenging from Roadside Springs in Appalachia" was cited in this Washington Post article titled "After generations of hauling water, a corner of Appalachia still waits for a better future" on June 28, 2021.

--

In 2019, Virginia Tech researchers tested 21 springs in five states in Appalachia, including West Virginia. They found *E. coli* in most of them.

Read the full Washington Post article on our website in our BSE Newsroom.

On June 17, 2021, NBC News wrote an article titled "All the water's bad: In McDowell County, you have to get creative to find safe drinking water." This article talked about the drinking water issues in the community that BSE graduate student, Hannah Patton, and Dr. Leigh-Anne Krometis are working with in West Virginia!

--

Scores of homes across Appalachia, an area rich in natural gas deposits, have experienced similar issues with well water, said Krometis. But the connection between contamination and industrial activity, such as mining and fracking, is often impossible to prove. (A spokesperson from West Virginia's Department of Environmental Protection said it routinely inspects sites that have been issued permits by the agency to ensure compliance with state and federal regulations.)

Krometis and a graduate student tested the Coopers' wells, along with nine other home wells in the county. In the Coopers' wells, they found levels of iron, manganese, strontium and barium far exceeding EPA drinking water standards and recommendations. They also tested the roadside spring where the Coopers gather water, finding *E. coli* and other coliform bacteria, which could come from animal or human waste.

Read the full NBC News article on our website in our BSE Newsroom.

